OPTIONS FOR DEVELOPMENT OF A REGIONAL SOLID WASTE LANDFILL AUTHORITY: EASTERN SLAVONIA

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Prepared by

Alan Edmond
Charles Peterson

Abt Associates
Cambridge, MA

under subcontract to

The Urban Institute

THE URBAN INSTITUTE
2100 M Street, NW
Washington, DC 20037
(202) 833-7200
www.urban.org

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TABLE OF CONTENTS

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INTRODUCTION AND PURPOSE

Three large municipalities in Eastern Slavonia—Djakovo, Osijek, and Vinkovci—have had discussions on the formation of an authority for the development and operation of a landfill for waste disposal, and have held at least preliminary negotiations with a French company about its potential capital investment in, and/or management of the new solid waste entity. Meanwhile, Osijek-Baranja County officials are in the midst of a solid waste strategy for the region which may be at odds with the tentative disposal plans of the municipality group. Moreover, Vukovar-Srijem County officials, under a 1999 deadline for forming their own plan for solid waste disposal, have not thought through all the transport and disposal possibilities for a two-county effort. Two large municipalities within Vukovar-Srijem County—Vukovar and Vinkovci—are interested in making regional arrangements across county lines, with the most likely disposal site to be within the triangle formed by the three municipalities, possibly nearest to Vinkovci.

The counties are responsible for site approvals and for bringing the rural municipalities into a coordinated solid waste program, however configured. Diseconomies of scale and the understandably low priority given to collection and disposal by the smaller municipalities in this early postwar era, make it difficult for counties to coordinate activities and to enable municipalities to improve their methods, and to clean up their temporary municipal dumps and the "wild dumps" that spring up without control in various places.

Collection of solid waste is performed by both public and private companies under concession arrangements with the municipalities. The ownership status of those companies, and the level of efficiency of each need to be examined in order to devise and promote optimum organizational and operations procedures to stabilize collection costs in the face of major necessary capital investment at the new facility, as well as for solid waste transport and management by the authority or its contractors.

At this time it is evident that the municipalities are working in parallel, and are not holding regular or systematic discussions about solid waste options and the intricacies of coordinating the municipal and private solid waste activities of a large number of jurisdictions within the two counties. Conversations with local and county officials have revealed serious jurisdictional issues and some major differences in technical approach, which if brought to an open forum of all involved parties, can be solved within a few months. Moreover, respondents seem willing to move ahead on joint plans once political leadership emerges and takes root.

Therefore it is the purpose of this assignment to assess the legal, technical, and intergovernmental problems associated with bringing all parties together in a systematic, harmonious, and proactive fashion, and to find mechanisms to reconcile differences among the parties under strong political leadership. The deliverable product, below, is an assessment

of structural and procedural issues, and a description of steps which will start the project moving rapidly and efficiently.

SUMMARY AND OVERVIEW

The three solid waste collection departments are typical in the functions they perform for municipalities. That is, they are "cleaning companies" which primarily pick up trash, maintain greens and other public areas, perform light maintenance on streets, and plow snow. There is an overlap in the functions performed by individual employees, due to seasonal factors. Administrative staff are accounted for by percentage of time dedicated to each activity (profit center) in Djakovo and Osijek.

In Djakovo and Osijek the companies are "public' in their legal status, while in Vinkovci, the Nevkos Company is strictly a private, employee-owned enterprise operating under a concession agreement with the municipality. There is no significant budgeted subsidy from the municipalities to the companies, and the two municipal companies are budgeted separately from their municipalities, with the ability to retain earnings and sustain losses independent of the municipal government. The private company, Nevkos, is proprietary to the extent that the books are not for public scrutiny, except when the municipality needs cost and expense information from Nevkos in order to set rates for customers.

Each company makes a profit, subject to national government taxation at a 35 percent rate. As is the practice wherever such corporations are taxed, the companies try to minimize their tax liability by reinvesting profits and finding other creative ways to understate earnings. Rates in each municipality are set by municipal authorities based on recommendations from the companies. The individual customers, both residential and commercial, are charged by the companies.

Fee payment delinquency is a problem in each municipality, due to the poor economic conditions, and each is optimistic that revenues will pick up as the economy recovers. The rates for pickup and disposal do cover the expenses and provide a reasonable profit, yet those rates have remained stable over the past few years, even in the face of double digit inflation and the need for each company to upgrade its equipment and landfill operations. This may indicate a very strong sensitivity on the part of citizens to any increase in the fees charged for municipal services, and a preference by the companies to make some profit rather than reinvesting all surplus funds in equipment or expanded operations.

Two somewhat disturbing practices have been observed as to the fee structures. In Osijek, those industries unable to pay fees in cash are involved in a barter arrangement, which invites abuse. In Vinkovci the private company pays the municipality 10 percent of its gross revenues as a franchise fee. This is common in robust economies, but unusual in an area where the citizens are having difficulty meeting basic needs, and might, if sufficiently informed on the budget process, resist fattening the municipal coffers by paying a 10 percent premium.

The major political difficulty facing those who wish to form a regional entity is the primacy of counties in the Croatian intergovernmental scheme, where municipalities want to carry on operations with as little county oversight as necessary. County governments are by law both the primary local self government units and political subdivisions of the state. They are not inclined to delegate or abdicate powers to the municipalities, and they use their regulatory and oversight authority as a deterrent for municipal assertions of autonomy.

There is a third institution, as yet untested in the Croatian setting, and that is the regional authority enabled by law. A regional solid waste authority, when established, will be comprised of its constituent municipalities, and indirectly, the municipal and private trash collection companies in the two-county area. There is, of course, some apprehension on the part of all that this organization, which will be neither fish nor fowl, will be beyond the control of the county and the individual municipalities. This is anticipated by some to cause problems in overall cost control for solid waste management, and by others to interfere with the relationship of the municipalities and counties with the trash collection companies.

These problems, however, are not unique, nor are they insurmountable. The consultants have observed, analyzed, and solved these problems in the United States and Central and Eastern Europe. The keys to success are to bring the parties into an open forum systematically managed, to identify and nurture political leadership, and to reinforce or create meaningful roles for all parties to the solid waste management process. Respondents agreed, in public discussions at any rate, that site approvals and management structure consensus are relatively easy issues to resolve once the turf problems have been laid to rest and the political leadership takes hold. Through a series of timely and positive USAID interventions in the process of forming a solid waste management district, and offering technical and administrative advice to key players as the authority matures, local and county officials will be able to establish a model of intermunicipal and intergovernmental cooperation which will have lasting results for the region.

The solution of these problems, and the creation of a solid waste district, will enhance the democratic objectives of the USAID program. It has been demonstrated through similar programs in other formerly socialist countries that grouping municipalities into regional authorities for specified purposes, under clear enabling laws, will promote local autonomy and an ethic of regional cooperation which will enhance municipal initiative and problem solving skills markedly.

FINDINGS AND RECOMMENDATIONS

The findings and recommendations of this assignment have been divided into four areas, which are:

— Landfill authority and intergovernmental relations;
— Technical and siting issues;

— Financial; and
— Regional economic development.

Landfill Authority and Intergovernmental Relations

Landfill Development

Finding. Disposal of solid waste is the legal responsibility of the community in which the waste is generated, as specified under Section II, Article 10 (1) of the Law on Waste (Official Gazette No. 34/95). Section II, Article 10 (2) of the Law enables units of local self-government to jointly implement waste management programs (e.g., landfills).

Recommendation. An environmentally acceptable disposal solution for waste should be pursued, as charged under Croatian law. In addition, the solution should be cost efficient.

Discussion. A regional landfill should be a lower cost alternative to the participants, due to economies-of-scale, than to upgrade the individual dumps to comply with the requirements of the Law on Waste (see "Landfill Design and Operation Standard" on page 11).

Nonetheless, the cost of disposal will be increased. The dumps used at present are low cost disposal options, because of the lack of environmental safeguards. Additional costs will be incurred to transport waste to a regional facility rather than the local dumps currently in use.

The price increase can be minimized, if the parties involved in segments of the waste management system (collection, disposal), seek cost efficient operations.

Facility Permitting, Environmental Compliance, Solid Waste Management Planning

Finding. The counties are responsible for siting approval and design review of proposed waste management facilities, and issuing the necessary environmental permits. In addition, environmental compliance and waste management planning are county responsibilities. These duties are defined in the Law on Waste.

Recommendation. The two county governments should be invited to participate in the siting and facility development process. At a minimum, the counties should be involved as technical advisors to the Authority (see "Public Participation" on the next page).

Discussion. The counties unquestionably have the responsibility for approval of the site and the facility design. The counties also will be inspecting the site for compliance with environmental regulations in the future.

By having the counties participate in the process, their involvement will assure that the Authority follows the appropriate procedures, and that the county staff understands the justification for the Authority's decisions. Furthermore, if the county participates in the process, then there should be minimal delay in receiving the needed approvals as the project is developed. A longer term benefit of a good working relationship would be future environmental compliance inspections, when the landfill is under construction and in operations.

The Authority will need to work with the counties on a long-term basis. A good working relationship between the Authority and the counties will make the regulatory aspects of the landfill project smoother.

Public Participation

Finding. Waste management, whether provided by a public or private entity, is a public service. The public, therefore, should be kept informed about the system and have the ability to influence the approach taken in providing the service.

Recommendation. The Authority should involve the public in its activities at several levels. The general public should be informed about the Authority's activities through media sources and allowing the public to attend meetings of the Authority's Board of Directors. In addition, the Authority should establish an advisory committee to the Board. This advisory committee should be composed of representative of various interest groups including counties, waste companies, civic leaders, and non-governmental organizations (e.g., environmental groups).

Discussion. At its most basic level, waste management is a public service designed to protect the health of the community served. In addition, the public (households and businesses), as rate payers, have a stake in the price charged for the service. This is particularly important in Eastern Slavonia, as there is no competition. Furthermore, in the case of the regional landfill, the public near the disposal site and along the transportation route to the facility, will be affected.

Public involvement in the activities of the Authority may require additional time to develop the regional landfill. However, as has been shown in similar projects in other locations worldwide, failure to include the public in the project development phase can result in opposition that will stop implementation. Such opposition may be on environmental, costs, or other basis. A well informed public can provide important guidance in shaping the direction of the Authority and in supporting the approach taken by the Authority.

Public participation should be undertaken on several levels. The basic approach is education, which can include distribution of factual material on the Authority and the reasons for development of a regional landfill. The media can be a valuable means of educating the public. Open meetings of the Board are also valuable in terms of media coverage and general public involvement. The public will be more supportive of projects developed in an open process. An advisory committee is another useful means of encouraging various segments of the public to influence the direction of the Authority.

Public participation in the forms mentioned above is designed to build support for the Authority and its goal of developing a regional landfill. This support will be useful as the complex process of developing a landfill proceeds.

Technological Waste—Management

Finding. Counties are responsible for the proper management of technological waste, under Article 11 (1) of the Law on Waste (see "Technological Waste—Quantification" on page 12). The hazardous waste portion of technological waste is the responsibility of the national government

Recommendation. The counties should participate with the Authority, at least in an advisory capacity, to insure that the daily waste quantity the landfill is proposed to receive includes the portion of technological waste suitable for disposal in a municipal waste landfill. Furthermore, the counties could assist in establishing operating procedures for the screening of incoming waste. Those procedures should be designed to detect types of technological waste (e.g., dangerous) as well as other types of waste that inappropriately are attempted to be delivered to the landfill.

Discussion. A municipal waste landfill can accept technological waste, except for dangerous wastes. Proper disposal of these wastes is important from an environmental and public health perspective, and the counties should work with the Authority to assure that the landfill is designed with sufficient capacity to accept such waste. Otherwise, there could be a lack of suitable disposal capacity for non-dangerous technological waste.

From the perspective of regional economic development, provision of the needed disposal capacity is important in terms of attracting companies to invest or locate manufacturing operations in Eastern Slavonia. The landfill, therefore, is part of the infrastructure needed to support economic growth.

Acceptance of suitable types of technological waste should be of considerable interest to the Authority. This waste stream represents a business opportunity to generate an additional source of revenue for the landfill operation.

Landfill Capacity—Marketing

Finding. Landfills achieve definite economies-of-scale as the daily waste quantity received increases. In addition, there is a lack of environmentally acceptable disposal capacity in the two counties as well as in this region of Croatia.

Recommendation. The Authority should expand the quantity of waste to be received to include other parts of the two counties as well as from other counties in Croatia.

Discussion. To achieve economies-of-scale at the landfill will require additional waste. This waste can be attracted in two ways:

> One option is to extend the potential for communities to participate in the Authority as a Board member. An incentive for communities to participate directly in the Authority would be assurance of disposal capacity for the life of the landfill.
>
> Another approach to gain waste is to offer disposal contracts that would provide landfill capacity for a defined term (say five years). Such contracts could have renewal provisions that could be exercised at the mutual consent of both parties.

The marketing of this capacity in terms of transporting the waste to the landfill is addressed in “Regional Transportation System” on page 15.

Waste Management—Existing Companies

Finding. The existing waste management companies in the three cities are providing waste collection and disposal services. The collection services are at an appropriate level. There may, however, be opportunities for increased efficiency. Waste disposal is by means of controlled dumps, except for Osijek which is operating a low-grade landfill.

Recommendation. The existing waste collection companies should examine their operations for opportunities to improve cost effectiveness. The Authority has no reason to become directly involved in the collection activities of these companies.

Discussion. Disposal costs will increase as the level of environmental protection for waste disposal is improved. One option to minimize this impact on the rate payers is to improve the efficiency of collection. This would reduce the cost of this part of the waste management system. thus allowing the percentage increase of overall waste management (collection plus disposal) to increase at a lower rate.

Waste Management—Collection

Finding. The waste collection companies are operated independent of each other. There was no expressed interest in competing for business against each other or other

collection companies in the area. The only specified area of expansion is into communities in Sector East after reintegration.

Recommendation. The companies should pursue business opportunities as they become available. There is no reason for the Authority to become directly involved in the business activities of these companies.

Discussion. The companies should pursue business opportunities as they become available. Delivery of waste management services to other communities in the region could allow a company to be more cost effective through economies-of-scale in management, purchasing, maintenance and other aspects of the business. Furthermore, competition among the companies for business should assure that consumers would receive reasonable prices for the service received.

Waste Management—Landfill

Finding. There have been discussions by the cities with at least one international waste company. This company reportedly expressed an interest in being an investor in the landfill and possibly providing operations services.

Recommendation. The selection of a company to invest in and/or operate the regional landfill should be made on the basis of a competitive procurement process, see next section below.

Discussion. A competitive procurement process will enable a variety of potential investors and/or operators the opportunity to make offers to the Authority. In this type of approach, the Authority is able to select the company that will provide the best business deal. This will benefit the Authority and the rate payers whose waste will be disposed of at the landfill.

Landfill Design, Construction, and Operation—Procurement of Services

Finding. The design, construction, and operation of a landfill is a complex process, and the Authority should select an experienced team based on a competitive procurement process.

Recommendation. The Authority should seek, through a competitive procurement, a qualified team to undertake this project.

Discussion. A well structured procurement process will result in the selection of the best qualified team to design, build, and operate the landfill at the lowest cost.

One procurement approach is to initially request qualifications from prospective teams. Those teams deemed qualified would be short listed to receive the technical specifications, and to submit a proposal. The tendering process should be based upon a well defined set of project specifications, so that the review of the proposals received in the second phase can focus on the proposed costs.

Selection of a single team for the project will focus responsibility for the project onto one contractor—the lead company of the team. This avoids the universal confusion created when separate contracts are awarded for component parts of a project. With the entire project awarded to a team, it is their responsibility to deliver the specified product (e.g., landfill that meets the tender requirements for design, construction and operation). This avoids putting the Authority in a position to monitor various contractors and provide guarantees on the quality of their work to other contractors. Furthermore, a single contractor provides assurance that the parts of the team will work together for an integrated project.

Operations should be part of the procurement package. The operating period of the resulting contract can range from the life of the site (say, 20 years) to a shorter term (say, three to five years). With a shorter term, this provides the opportunity for other operators to bid on the project in future years.

Shorter term contracts can result in less satisfactory service as the selected contractor has less incentive to take a longer term view towards the project than the length of its contract. A hybrid option is to tender the overall project including operations with an initial short term contract period and options to renew over the life of the landfill. These options which should be at the Authority's discretion.

Provision for Waste Collection

Finding. A high percentage of the residents of both counties have no organized collection of their discarded waste. The reported level in Osijek-Baranja County and Vukovar-Srijem County are 43 percent and 72 percent, respectively. These levels may be overstated because portions of both counties are in Sector East, which was assumed to have no organized waste collection.

Recommendation. The counties should arrange for residents to at least have a designated drop-off location where waste could be deposited. A container should be stationed at the designated sites, and the container emptied on a regular basis. The waste collection service should be contracted out in a public bid process, so that the lowest qualified bidder is selected. Given the area that needs to be covered in the two counties, the counties should be divided into several collection districts. This approach would give prospective contractors several opportunities to successfully bid on a service area.

Discussion. This suggestion has little to do with a regional landfill authority, and more with providing basic waste management services. Adequate opportunity for waste

removal should minimize the waste taken to "wild" dumps, which would reduce the public health and environmental impacts associated with such disposal practices.

Technical and Siting Issues

Landfill Siting

Finding. A process needs to be established to identify suitable sites for a landfill.

Recommendation. The siting process should focus on a set of defined siting criteria so that an acceptable location can be selected. The siting criteria should consider a variety of issues, including:

Technical
- Geotechnical, hydrogeological site characteristics
- Seismic or other unstable (e.g., highly compressible soils, including clay; sink holes) site characteristics
- Presence of low permeability of soil (e.g., clay)
- Sufficient depth from base of landfill to ground water
- Lack of surface water, including flood plains, in close proximity to landfill footprint

Land Use
- Acceptable adjacent land uses (e.g., 400 meters distance between landfill and residential and agricultural areas)

Transportation
- Suitable transport system to support waste deliveries
- Cost of transport for waste generators to ship waste to landfill site

These siting criteria should be agreed upon by the communities that will form the Authority, the County as regulators of disposal practices, and the Ministry of the Environment. In addition, the public should be allowed to comment on and offer suggestions on the siting criteria

Discussion. Preliminary consideration has been given to facility sites by both the City of Osijek, as a leader of the proposed Authority, and in a planning study for the Osijek-Baranja County.

The location suggested by the City was in the vicinity of the mid point between it, Djakovo, and Vinkovci. Such a site would have comparable transport cost for the three cities to haul their waste to the landfill. As stated by the city representative, the specific site(s) that are suitable would rely upon a siting study.

The County's waste management plan identifies six sites for future landfills. The six sites are or were being used for waste disposal. One of the sites is Osijek's former dump in Nemetin, which will be available with reintegration with Sector East. The facility may require substantial improvements to bring the site to an acceptable level of operational ability and environmental protection.

Even with these preliminary siting efforts by the City and County, identification and selection of a suitable site should be an outgrowth of a comprehensive evaluation. The geographic focus of the study should be limited to a defined area, such as the zone within the triangle formed by the three core cities. The value of a comprehensive site evaluation is that the Authority will have a firm basis to defend the landfill location, if the site is challenged.

Actual selection of the location for the landfill will most likely be a contentious issue even with a comprehensive site evaluation, unless a willing community is to be host for the disposal site. An option to identify a willing host community is outlined in the next section.

Landfill Host Community Payment

Finding. The acceptance of a landfill outside the community in which the waste is generated may be an obstacle to the success of a regional approach to waste management. More importantly, under Article 48 of the Law on Waste, compensation would be required to be paid to the self-government unit where the landfill would be located. Also compensation would need to be paid to the property owners in immediate proximity to the landfill. For the property owners, compensation is to be based on the diminished market value of their real estate.

Recommendation. A financial incentive package should be developed by the Authority members and marketed to the communities in the region. The intention of this package is to seek communities that will volunteer to host the landfill, rather than to coerce a village into participating. A willing host community would still need to meet the site selection criteria.

Discussion. Finding a willing host community for an undesirable land use, such as a landfill, is difficult. This condition, which is universally expressed by the acronym "NIMBY", or "Not In My Back Yard", was mentioned as a potential hindrance in several of our discussions.

A typical approach to seek a willing local partner is to offer a financial benefit package, which can be very attractive for rural areas. Such a package for a landfill could include free disposal plus a payment for each tonne received at the landfill. The suitable level of a host community fee is difficult to judge in this situation.

In the United States, host fees range from $1 to $5 per ton of waste received with most fees in the $2 per ton range. Comparable disposal charges vary, but in the Northeast range from $15 to $35 per ton, depending on a landfill's proximity to larger cities.

An estimate for a host fee is in the range of 0.15 kuna per tonne. This fee would yield an annual payment for the host community of almost 11,300 kuna per year. This amount was based on an estimated waste discard rate of 75,000 tonnes per year from the three cities that currently comprise the Authority.

Additional host fees would be generated if waste from other sources is received at the landfill. Even under the base amount, the annual host fee is substantial relative to current revenues generated by villages. These funds could be used to provide the villagers from the host community with extra services they do not currently receive and/or reduce their taxes.

An approach to marketing a proposed financial package to potential host communities is to prepare a prospectus of these benefits along with a description of the project. The prospectus should be distributed to officials of villages within the targeted geographic area. In addition, interested communities should be invited to the proposed project development meeting, see "Implementation Schedule/Next Steps" on page 16 to learn more about the landfill and the benefits that would be derived by the community selected to host it.

A well structured financial package should result in villages offering to host the landfill as willing communities. A willing community means a positive relationship with the landfill's neighbors rather than one of conflict. Since the landfill should be sited as a long-term disposal operation (e.g., minimum of 20 years), a good relationship with the host community is important to establish.

Landfill Design and Operation Standard

Finding. The Ministry of Environment is preparing new landfill design and operation regulations that will set a minimum level of environmental protection for waste disposal sites. These regulations should be issued within three months.

Recommendation. The participants in the Authority should work closely with the Ministry to understand the proposed regulations and their impact on the required design and operation for the landfill. Attention should also be given to the effect the regulations will have on existing disposal sites.

Discussion. The regulations that will result from the Law on Waste will require that disposal sites be upgraded to meet a higher environmental protection standard, than exists at present. Under such a condition, the cost of operating the existing dumps, which except for the one in Osijek are lacking in environmental safeguards, will increase.

A regional landfill should be a lower cost alternative to the participants, due to the economies-of-scale with the larger facilities, than to upgrade the individuals dumps to comply with the regulations. These regulations will likely encourage other communities in Eastern Slavonia to seek participation in the Authority, either as members or under contract, in order

to control their disposal costs. Furthermore, enforcement against existing dump sites will likely be more aggressive with a viable, environmental compliant disposal option in operation.

The Authority would benefit from increased participation, as the unit cost for disposal would probably decline with increased waste quantities. Most disposal costs are fixed over fairly wide waste quantities, so receiving additional waste should reduce unit costs.

Technological Waste—Quantification

Finding. The quantity of technological waste reported to be generated appeared to be much greater than the amount being disposed of.

Recommendation. The Authority should conduct an assessment of the quantity of technological waste being discarded.

Discussion. A reliable data base on the quantity of waste that could be delivered to the regional landfill is important to the design of facility. Technological waste is the waste stream that has the greatest uncertainty with regard to the amount that requires disposal.

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Financial

Landfill Development Capital Costs

Finding. The front-end cost for a landfill can be significant. Front-end costs include: siting, land acquisition, design and construction, acquisition of mobile equipment (e.g., waste compactor), and site infrastructure (e.g., roads, weigh scale). No return on this investment is received until the facility begins operations.

This front-end cost will be a substantial increase above the level of investment these cities, except perhaps for Osijek, have made in their disposal sites. This increased cost will be translated into a higher service charge for the rate payers, which could result in a political problem.

Recommendation. The front-end cost should be, at least partially, covered from tax revenue on a proportional basis from the member cities.

Discussion. The cost of the proposed regional facility will increase the cost of waste disposal for those who use the facility, at least in relation to current costs. Should the proposed landfill regulation (see "Landfill Design and Operation Standard" on page 11) require all facilities to upgrade, then the regional site would most likely be less expensive than for each community to upgrade its own dump site.

In any event, there will be a cost increase to the households and businesses that send waste to the landfill. To avoid rate shock, the cost of the facility development

above a designated increase in the existing waste collection and disposal rate (say 25 percent) could be absorbed by taxes.

This would not eliminate the need to cover the cost of the capital investment. This approach would minimize the negative impact of a rapid cost increase paid by the waste generators. A sharp rise in the rate for waste management would result in an increase in the amount of waste being deposed of at "wild" dumps, which would be counter to the environmental benefits that could be achieved by a regional landfill. Furthermore, there could be a negative public reaction to a sharp rise in the charge for waste management services.

The waste management rate should continue to escalate on an annual basis at an agreed upon rate until the entire cost of the landfill (capital and operations) is covered by the user charge. This phase-in to cover the full cost of disposal should be limited to no more than five years.

The rate charged by the landfill would be based on the site's actual cost, including profit. Therefore, a local government that chooses to cover part of the landfill cost through taxes would pay part of the disposal charge. The balance would be paid by the hauling company serving that community.

This is one aspect of the regional landfill that would benefit from a well designed public participation program (see page 5).

Service Charge

Finding. The service charge for waste collection and disposal is based on the household or business area under roof. Expressed as kuna per square meter per month, this basis for pricing waste management services is, at best, an indirect measure of the service received. It is also capable of being changed, in that it is by custom and not law.

Recommendation. The basis for the charge should be changed to a direct indicator of the service received, such as payment for container or bag collected. Under the recommended change, households and businesses would contract with the waste company for a specified level of service (e.g., number of containers per collection).

A phase-in of this recommendation is warranted, as the change is a significant departure from the traditional basis for charging for waste management in Croatia. Businesses are the recommended candidate to begin a phase-in.

Discussion. The recommendation in this section would accomplish several objectives. One objective would be an equitable apportionment of the cost of service based on the quantity of waste discarded by households and businesses. It was mentioned in the meetings with the waste companies that most manufacturers are having difficulty paying their

service charges as they are operating below capacity. Their waste management charge has remained the same even though the companies are generating less waste. The recommended change would put waste management on the same cost basis as other metered utility services such as electricity.

A second advantage with a direct user charge system is that generators would have an economic incentive to recycle as well as reduce the quantity of waste generated, since their cost of service would be a reflection of the amount of waste set out for collection and disposal. One of the stated goals of the Law on Waste is to reduce the volume of waste that requires disposal. While a decrease in the waste quantity might adversely affect the economics of the landfill, this could be offset by marketing the disposal capacity to other communities in the region (see “Landfill Capacity—Marketing” on page 6).

Businesses are the preferred candidate to begin a phase-in. Industries and commercial companies will tend to modify their waste generation practices in response to costs in a more direct manner than households. Their response will give a good indication on whether the recommendation will result in changes to operations that result in the generation of less waste.

The timing on instituting a change in the basis for charging for waste management services would be well suited to the establishment of a regional landfill. In general, it is preferred to combine several modifications to a waste management system rather than to implement changes separately.

Regional Economic Development

Regional Environmental Industrial Park

Finding. Development of a landfill, even with a willing host community, may be viewed as an undesirable land use.

Recommendation. The landfill should be developed as part of a regional industrial park that would focus on environmental related ventures.

Discussion. This park could marketed for development of a variety of waste related activities, including:

— Composting of organic materials (e.g., food waste, non-recyclable paper, sludge);
— Processing facility for recyclable materials; and
— Storage and/or treatment facility for dangerous (hazardous) technological waste.

Compost could be marketed for local agricultural use, or if the quality or seasonal demand was insufficient, the composted organics could be used to meet landscaping needs at the landfill.

The latter activity could include: processing of household recyclables to meet market standards for quality (e.g., removal of contaminants), processing of construction and demolition debris, and consolidation and marketing of traditional recyclables (e.g., scrap metal from automobiles and household appliances).

Proper management of dangerous technological waste could be viewed as a benefit for local manufacturers as well as international manufacturing companies interested in investing in Eastern Slavonia. This would aid in stimulating overall economic development in the region. This operation could be as simple as a consolidation point to store such material until it is shipped to a treatment facility. Treatment, of at least some of the dangerous waste generated in the region, also could be done. This type of operation might be jointly funded by regional manufacturers.

Additionally at some time in the future, methane gas from waste decomposition may be generated in sufficient quantity to justify its recovery as an energy source. Recovered methane could be used a fuel source. One option is to use the fuel in manufacturing. Given the quantity of clay in the region, the methane could be used in brick production. Under this scenario, clay would be excavated from the landfill area for brick production and the resulting pits used as disposal sites in the future.

Another use that has been undertaken at a few landfills, at least in the United States, has been to supply energy for a hydroponic green house complex located at the disposal site. Higher value vegetables and other crops for the regional market could be grown in such an agricultural facility. A facility could be developed as a commercial venture, perhaps in conjunction with the agricultural department of a local university.

These activities would most likely be developed several years in the future. Nonetheless, the regional authority should plan for the development of these activities in terms of sufficient land area and supporting infrastructure, such as electricity, water, sewer, and transport.

Regional Transportation System

Finding. The regional landfill could be developed with sufficient capacity to meet the disposal needs of communities in Eastern Slavonia, in addition to the three core cities, as well as other areas of Croatia. Shipment of waste from the wider region to the landfill will require updated transport systems.

Recommendation. As the service area for the landfill expands, attention should be given to the use of a combination of transport modes. These modes include truck and rail. Attention should be given to the use of intermodal containers as a means of handling waste being shipped to the landfill, and to facilitate a combination of truck and rail in a waste move.

Discussion. A combination of truck and rail shipment of waste to a regional landfill is a future possibility. Truck is the most common means of transporting waste from a transfer station to a disposal site. However, truck transport will increase traffic on the existing road network. Upgrading of the road system will minimize such congestion, and can benefit the movement of other goods over local highways.

For both short and, particularly, longer waste hauls rail can provide a lower cost option than truck. Waste shipments by rail will have an added benefit of stimulating rail freight activity. Waste is being shipped by rail in a number of locations in Europe, the United States, and Japan.

Unless the transfer facility at the origin of the waste shipment and the landfill are directly rail served, which is unlikely, the preferred method to transport waste is in intermodal containers. The containers can be shifted between transport modes (truck and rail) with minimal effort and no need to re-handle the waste.

Shipment in intermodal containers is the fastest growing means of transporting goods worldwide. An intermodal waste handling system could have a positive secondary impact for the region of stimulating the movement of other commodities and goods in this manner, which could have benefits in terms of global trade. Part of the stimulus would be an outgrowth of the development of an intermodal container handling facility to move waste containers between truck and rail.

IMPLEMENTATION SCHEDULE/NEXT STEPS

The following is a set of suggested next steps in order to get over the political hurdle of site selection, and to organize the municipalities to carry on a rational process for proper waste management, at the same time allowing the counties to play a legitimate, major role in the coordination of activities. These early steps will lead to a summer of site selection decisions and the acquisition and startup of site improvements by mid 1998.

Late March

Osijek, Vinkovci, and Djakovo sign the MOU, with the support of USAID. Shortly after that meeting USAID affirms that up to $50,000 will be made available, on an invoiced basis, for survey and analysis for 2-4 sites considered most suitable. Osijek reports that some sites have had studies performed on them at Osijek's expense, so the $50,000 should be carefully parceled out for entirely new studies to supplement those done on existing sites or on new sites. An option for the $50,000 is to analyze the regional transportation network and consider the possibilities for transporting waste in, both for disposal and recycling, to a central site. The study would consider rail transport as well as trucking, and its aim would be to develop a broader customer base to offset capital and operating costs.

Using the $50,000 on a transportation study would have the effect of keeping the siting studies (and the number of sites that will stay under active consideration) within reason. It would also prompt the municipalities and counties to think beyond siting and consider the opportunities for increasing revenues dramatically.

If the MOU is approved as written, a committee of city officials will form up, with the chair to be from Osijek. AID should recommend also that a technical committee be formed, and that it be comprised of one member from each of the four cities, and have as ex officio members the relevant department head from each of the two counties, the Ministry of Environmental Protection inspector for the two-county area, and Salim Kublawi.

Following the meeting, and after vetting the timetable for creating the solid waste district with the policy making bodies in Osijek, Mr. Herman personally contacts the appropriate officials in both counties. He informs them of the intention of the municipalities to have the two counties and agencies of the national government participate in the planning process in an advisory capacity and also in their roles as enforcers of solid waste regulations and regional solid waste plans.

Late April

USAID conducts a briefing for newly-elected municipal officials in the two-county area as to the potential for regional cooperation along solid waste lines, with the broader agenda of indoctrinating them in the laws on local governance which permit municipalities to take initiatives in areas which do not conflict with county prerogatives.

Richard Wilcox of UNTAES Civil Affairs has requested co-sponsorship of a workshop for Sector East s newly elected officials at that time, with the subject being the nuts and bolts of policy and administration in a government that is becoming democratic. Co-sponsoring and presenting such a workshop would have obvious benefits in bringing these people together and cementing AID's role as facilitator for new local governments, and would provide a real opportunity for their networking with officials from other parts of the two counties.

Also at this time, USAID stays in close contact with the apparent members of the committee to be formed under the MOU, and better defines the potential use of the $50,000. This will provide an opportunity for USAID to become, if not a major player, at least a close observer of the dynamics of site selection. This will be the time to exert some influence on the siting outcome, and to broker whatever small compromises may be needed to move the regional concept along.

Early May

Prior to the first official meeting of the political committee in mid to late May, USAID prompts discussions of proper siting criteria and tries to broker the elimination of sites which have a low probability of receiving a permit due to hydro geological, locational, and other

factors. This will involve a careful analysis of existing plans, probably by a Zagreb engineer paid on a daily basis.

Mid to Late May

The organizational meeting of the political level committee meets, elects a chair, and charges its technical committee, which is also present and primed. The major charge will be to come up with a siting scheme for a workshop to be presented in early to mid June. Part of that charge will be to develop a siting plan consistent with the national solid waste regulations and the MEP inspector's criteria.

The plan will outline an analysis of each of the six county-proposed sites and any new ones any municipality is seriously proposing. To the extent possible, the sites will be ranked, and areas of missing information will be identified for each. Completed studies will be listed, and any new studies for any of the sites will be costed out.

USAID reiterates its commitment to spend up to $50,000 only if the workshop scheduled for June is highly likely to reach consensus on two or three potential first sites, based on national siting laws and other rational criteria, as reported to the group assembled by the technical committee.

Early June

USAID convenes a workshop to include at least the four cities, the two counties, the Ministry of Environmental Protection, and selected local governments from Sector East and other parts of Croatia. Subjects for discussion and collective action are;

> Presentation by the technical committee on their findings regarding final disposal sites, and a scheme for carrying out final site analysis studies using $50,000 in USAID funds and other identified funds if necessary.
>
> A discussion of the findings and recommendations of this report and an action plan to carry out those recommendations with which the political committee agrees are legitimate concerns of a new solid waste authority
>
> Presentations by authority members, including counties and Ministry officials, and outside experts, on technical issues such as the new disposal regulations, regional optimization of collections, and transportation of solid waste

The major outputs of the workshop will be a narrowing of the possibilities for disposal sites, and a budget for carrying out the final site selection studies. A secondary output will be the creation of a formal relationship among all participants, with a set schedule for joint meetings and for accomplishing program goals.

APPENDIX 1

THE EXISTING SOLID WASTE MANAGEMENT SYSTEM IN EASTERN SLAVONIA

This Appendix provides background information on the characteristics of the waste stream and existing waste management practices in Eastern Slavonia. Eastern Slavonia is composed of two counties: (1) Osijek-Baranja and (2) Vukovar-Srijem.

Each of the counties has four cities. The cities in Osijek-Baranja County are: Osijek, Djakovo, Valpovo, and Beli Manastir. The latter city is in Sector East. The County also has 30 villages. Vinkovci, Zupanja, Vukovar, and Ilok are the cities within Vukovar-Srijem County. The latter two cities are in Sector East. There are 22 villages in the County.

The cities that comprise the core (core cities) of the Authority are: Djakovo, Osijek, and Vinkovci. After reintegration, Vukovar will be invited to join the Authority. (Vukovar was invited to attend the MOU signing meeting, but did not attend.)

SOLID WASTE CHARACTERISTICS

The discards that would be received at a landfill can be divided into several categories, all of which are non-hazardous (non-dangerous) wastes. In Croatian terms, the two basic categories are: (1) communal waste and (2) technological waste.

Communal waste corresponds with the term municipal solid waste, which is used in the United States. In addition to household and commercial (e.g., retail, office) waste, communal waste includes: appliances, discards from hospitals, and green waste (e.g., organic material from parks).

Technological waste encompasses all waste from industrial activities as well as construction and demolition debris. Non-dangerous and dangerous wastes are the two primary components of technological waste. Only the non-dangerous wastes could be disposed of at the regional landfill.

The quantity and composition of these wastes bear on the amount of material that requires disposal (landfill) and the potential for recycling and composting.

Waste Quantity

The net amount and type of waste discarded for collection and disposal is a function of the degree to which waste is being recycled and/or composted. This relationship can be expressed by the following formula:

Discards = Gross generation – Quantity recycled and/or composted

Gross Waste Generation

Gross waste generation is directly related to demographic and economic conditions. As such, the quantity of waste discarded in an area (e.g., Eastern Slavonia) will vary over time as the population and economic conditions change.

The quantity of residential waste generated in an area is a function of population. Individual waste generation rates (tonnes per capita per year), however, will vary depending on several factors. The key factor is the amount of disposable income available to spend on goods and services. In general, urban residents have higher waste generation rates than those in rural areas.

Recycling

Representatives of each of the core cities expressed an interest in recycling. The current level of recycling, however, appears to be relatively low in Eastern Slavonia, although no definitive data were available on the recycling rate. For Croatia, the reported annual (1995) average recycling rate was 83 kilograms per capita. This includes recycling of household, commercial, and industrial waste.

Osijek has a drop-off recycling yard located at a paper recycling facility on the west side of the city. Containers are available for recovery of a variety of materials. The company that operates the recycling yard also sets out five cubic meter containers throughout the city for collection of waste paper from household, commercial, and industrial generators. A reported 200 containers are in use in Osijek and the surrounding communities for waste paper collection.

The Osijek division of the company collects about 250 to 300 tonnes per month of waste paper. Within the two county region, waste paper collection amounts to about 500 tonnes per month, or 6,000 tonnes per year.

The City of Osijek is beginning a study of options for expanded recycling. The study is scheduled to be completed by late Spring.

Three dealers in scrap metal were reported to be in operation within Osijek. There are apparently no dealers in Djakovo or Vinkovci. Both of these cities have substantial amounts of scrap metal (e.g., automobiles, household appliances) at their dumps.

Discards

Based on a waste management plan done (1996) for Osijek-Baranja County, the total amount of communal and non-dangerous technological waste discarded by the core cities

amounts to an estimated 75,118 tonnes per year (see Table 1.1 on the next page). (Note: A tonne is a metric ton, which is 1,000 kilograms, or 2,200 pounds.)

Table 1.1
Eastern Slavonia Waste Discards

	Communal		Total[a]	
Location	Tonnes/year	Tonnes/day	Tonnes/year	Tonnes/day
Djakovo	5,095	20	15,866	61
Osijek	40,217	155	48,913	188
Vinkovci	9,389	36	10,339	40
Subtotal	54,701	211	75,118	289
Balance of Counties	77,326	297	78,811	303
Total	132,027	508	153,929	592

Note
a Total includes communal and technological wastes.

Table 1.2
Waste Discards for the Counties of Osijek-Baranji and Vukovar-Srijemska (tonnes per year)

Location	Population[a]	Household Waste	Total Communal Waste[b]	Per Capita Generation Rate	Non-Dangerous Technological Waste	Total Waste
Osijek-Baranji[c]						
Osijek	165,253	36,253	40,217	0.243	8,696	48,913
Djavoko	29,493	4,290	5,095	0.173	10,771	15,866
Valpovo	12,607	1,870	1,945	0.154	778	2,723
Belisce	12,456	4,680	4,755	0.382	0	4,755
Donji Mihljac	10,650	5,005	5,080	0.477	357	5,437
Other Opcine	68,273	12,970	13,744	0.201	0	13,744
Sector East	68,708	13,055	13,794	0.201	0	13,794
	367,440	78,123	84,630	0.230	20,602	105,232
Vukovar-Srijemska[d]						
Vinkovci	38,580	n/a	9,389	0.243	950	10,339
Zupanja	14,435	n/a	2,227	0.154	350	2,577
Opcine/Sector East	178,226	n/a	36,781	0.201	0	35,781
Subtotal	231,241	n/a	47,397	0.205	1,300	48,697
Total	598,681	n/a	132,027	0.221	21,902	13,929

Notes

a All population data for 1991, except for Osijek, which was reported as 1995.
b In addition to household waste, total communal waste includes appliances, hospital waste, and waste from green areas.
c Source: Nikolic, S., "Program Cjelovitog Sustava Gospodarenja Optadom za Zupaniju Osjecko-Barabjsku," ZGO, Zagreb. Srpnja 1996.
d Waste quantity data based on reported population data (1991) and use of comparable generation data from Osijek-Baranji County.

The core cities account for almost 49 percent of the waste discarded within the two counties. (Note: The amount of technological waste shown in Table 1.2 excludes 80,000 tonnes per year that was reportedly generated, but apparently are recycled or managed in some manner that does not require disposal. One recommended activity for the Authority is to identify the amount of non-dangerous technological waste that requires disposal.)

Almost 290 tonnes per day of waste should be collected in the core cities, based on a five day waste collection week. (Note: Some waste is disposed of in "wild" dumps, so that the amount collected is less than the quantity discarded.) Excluding technological waste, the amount of communal waste for disposal is 54,701 tonnes per year, or 210 tonnes per day.

The balance of the two counties discard an estimated 78,811 tonnes per year, or about 300 tonnes per day. The combined waste discards in Eastern Slavonia amounts to an estimated 153,929 tonnes per year, or 590 tonnes per day. A breakdown of these data is given in Table 1.2 above.

A nationwide waste management report, which also examined the waste situation in each county in detail, reported that communal waste generation in the two counties amounted to 108,640 tonnes in 1995. The nationwide report's waste quantity is about 18 percent less than the communal waste estimate shown in Table 1.1.

The differences between the two reported estimates is placed in better perspective with a comparison of generation rates. The communal waste generation rate given in Table 1.2 amounts to 0.60 kilogram per person per day; whereas the generation rate given in the nationwide report is in the range of 0.52 to 0.56 kilogram per person per day, or differences of 6 to 13 percent. The lower differences in generation rates than total waste quantities indicates that part of the discrepancy shown above was due to differences in the population reported for the two counties.

The estimated waste quantities are only order of magnitude estimates. The population dislocations caused by the war and the on-going disruption to manufacturing has resulted in a lack of definitive data. Waste generation is assumed to have declined. When the population stabilizes and industrial activity improves, increased levels of waste generation are expected.

Waste Composition

The composition of the waste stream gives an indication of the potential for and types of material that can be recycled or composted. Data on waste composition for Osijek, Djakovo, and an average for Osijek-Baranja County are given in Table 1.3 on the next page.

Table 1.3
Waste Composition (percent)[a]

Material	Osijek	Djakovo	County Average
Organics			
Paper			
Cartons	4.0	10.0	6.2
Other paper	8.9	5.0	8.4
Vegetation (greater than 40 mm)	29.6	20.0	29.2
Wood	0.2	5.0	5.2
Subtotal	42.7	40.0	49.0
Inorganics			
Glass	3.1	10.0	7.2
Metal			
Ferrous	1.8	4.5	3.3
Non-ferrous	0.0	0.5	0.7
Plastics	8.0	15.0	14.0
Subtotal	12.9	30.0	25.2
Miscellaneous			
Miscellaneous (greater than 40 mm)	37.9	15.0	19.6
Problem wastes	6.5	15.0	6.2
Subtotal	44.4	30.0	25.8
Total	100.0	100.0	100.0

Note
a Source: Nikolic, S., "Program Cjelovitog Sustava Gospodarenja Optadom za Zupaniju Osjecko-Barabjsku," ZGO, Zagreb. Srpnja 1996.

EXISTING SOLID WASTE MANAGEMENT SYSTEM

The existing collection and disposal practices in the core cities that comprise the Authority are addressed in this section. Waste collection and disposal practices in the balance of the two counties also are addressed.

Djakovo

Waste Company Structure and Ownership

An exclusive franchise has been given by the City to a waste management company (Univerzal) for collection within Djakovo. Univerzal, which is 100 percent owned by the City, also operates the dump used for waste disposal in Djakovo. Street cleaning services for the City and operation of the local cemetery are additional services provided by Univerzal, under contract with the City.

The company's service area includes the city of Djakovo and nine adjacent villages. The service has been provided to the villages since 1995, and allowed them to close their dumps.

Univerzal is a public company under Croatian law. Under its Articles of Association its ownership can be changed by a general meeting of its owners. This allows for investment in the company by private or other public bodies. In such cases the company is obliged to operate under Croatia's procurement laws.

The ownership of the company has not been fully settled, due to the new territorial division of municipal government in Croatia. While the ownership is nominally the Djakovo city government's, and the governments of the villages within the municipal limits of Djakovo, the obcinas in the area have claims on it, in that they want Univerzal to collect solid waste within their boundaries. Univerzal does not want the additional solid waste, due to its disposal capacity's being used up, and the management problems which would be compounded by more waste. Therefore Univerzal does not currently pick up waste in the outlying obcinas. This must be settled by an arbitration procedure under the Regulations on Work of the Commission of Government of the Republic of Croatia for Solving the Disputes on Municipality, City, and County Rights (37/94).

Meanwhile the company operates as if it is a city-owned entity, and the majority of ownership will not be relinquished by the city, regardless of the outcome of arbitration. Univerzal is currently under no obligation to collect solid waste from obcinas outside its current municipal boundaries, and the opinion of the consulting lawyer is that the obcinas will not have arbitration relief soon. Setting up a regional solid waste authority will moot the question.

The company has a board of directors consisting of two members appointed by the City Council who need not be City Councilors, and two members appointed by Univerzal, currently employees of it. The board meets once a month in private. The accounts are as open, as other municipal accounts are, subject to an annual audit. City council appointees are: Mr. Filip Calo, Mr. Marko Peric, and Mr. Zdravko Posavcecic. Univerzal's appointees are; Mr. Antun Soldo and Mr. Vilko Schvaler. The Director is Mr. Vlado Rechner (telephone: 031-811-018).

The company's jurisdiction is not prescribed by law, nor are the jurisdictions of the other two companies. A labor agreement is in effect which spells out conditions of work, but nothing

in it would prohibit an expansion of company activities. However, the company must negotiate any changes in hours of work, wages, and the numbers of employees per truck. Currently the drivers and collectors make 2,200 kunas per month. Unskilled staff make 1,950 kunas per month.

Overall there is nothing in the basic ownership of the company, its operational status, national law, or the legal status of obcinas which significantly limits or muddles the ability of the company to operate within geographical or size constraints. The ownership can be changed, including the sale of shares to outside groups, by a vote of the membership. Conceivably the county or another unit of government can buy shares.

Financial

The city council provides funds for capital purchases by Univerzal, although reportedly the contributions by the city in recent years have been sporadic and minor.. The company is not required to repay these capital investments, so the service charges outlined in Section 2.1.3 exclude the cost for capital depreciation of Univerzal's equipment.

A slight profit was reportedly earned from the service fee assessed the households and businesses for waste management services.

Service Charge

Households and businesses are charged a service fee based on the square meter area of building that houses their respective dwelling or work space. The current charges in kunas per square meter per month are:

Household	0.21
Business (less than 50 square meters)	0.78
Business (more than 50 square meters)	0.36

This charge, which is approved by the city council, went into effect in January 1997. The previous rate had been in effect for three years.

For households, service charges are collected quarterly. Collection is done on a door-to-door basis by Univerzal employees. Even so, an estimated 15 to 20 percent of service fees are uncollected.

Businesses are mailed an invoice on a monthly basis. A problem, particularly with commercial accounts is a lack of business activity since the war, which has distorted the perceived correlation between floor space and waste generation.

Collection

Quantity. About 8,000 tonnes per year is collected from the 7,524 households and 856 businesses serviced. The 5,322 households within Djakovo account for 70.7 percent of the total residences serviced by Univerzal.

Operations. Waste is collected five days per week with a fleet of three rear-load packer trucks and one load lugger. The packer trucks capacity ranges from 13 to 16 cubic meters.

The rear-load trucks are used to collect waste from households and smaller businesses. The five cubic meter containers used to collect waste from larger businesses are serviced by the lugger truck.

The packer trucks are staffed with one driver and two laborers. The crew is paid for 42 hours per week of work, but crews work on a "task and finish" basis. This means that a crew my leave once they complete their assigned routes for a day.

Households in Djakovo receive twice per week collection; whereas, waste in the villages served by Univerzal is picked-up once per week. Univerzal only collects household waste that is set at the curb for pickup.

Residents may store their waste in a variety of containers. Univerzal has provided households with metal waste containers (110 liters) in the past. The company is beginning to offer plastic containers with wheels. These lighter containers are easier for the residents to move to the curb., and for the collection crew to empty.

Disposal

Univerzal, and its predecessor municipal department, have operated the existing "temporary" dump site for the past 20 years. The waste deposited at the dump covers about 5.5 hectares.

Quantity. In addition to the estimated 8,000 tonnes per year of waste is delivered to the landfill by Univerzal, an additional 2,000 tonnes per year of waste is received from individuals. Individuals are allowed to dump their waste at no charge.

Operations. The dump, which is open to receive waste 24 hours per day, seven days per week, has four site employees. A Univerzal employee is at the landfill at all times.

An old track machine (i.e., bulldozer) is used to push waste from where it is dumped from collection vehicles. The waste was observed to be pushed over the edge of the dump. The dump was about seven meters above the base grade. The base grade slopes downward to form a depression from the area where waste was initially dumped.

A recently constructed building with a heated area for employees and a storage area for equipment was observed at the dump site.

Environmental Protection. Air emissions (e.g., particulates) were being emitted from smoldering fires at several locations in the active area of the dump. Other air pollutants were likely to also be being emitted from the dump.

There was no system to collect and treat leachate (water that becomes contaminated after passing through the waste mass). Several wells for monitoring ground water contamination are located around the dump site. It was reported that no contamination had been detected in the wells.

The portion of the site that has been closed to dumping has been covered with soil and seeded.

Osijek

Waste Company

Unikom is the company that provides waste collection and disposal services in Osijek. The company is 100 percent owned by the city. In addition to its waste services, Unikom also provides street cleaning and cleaning of green areas in Osijek. Before the war, Unikom managed the city zoo.

Since 1993, Unikom has been a stock company owned by the City. It was previously a department within the municipal government. The company has a five member Board of Directors that is comprised of four representatives of the city government and one from the company. The Board meets monthly, and the meetings are open to the public. Although 100 percent owned by the City, stock could be sold to private investors.

According to the Osijek Commercial Court, there is going to be arbitration over the ownership of the company, but like Univerzal , it operates as though it is totally a city-owned company. Director Glavas reports that when ownership is settled the city itself will own 78 percent and the 6 Self-Government Units within the old city boundaries will own 22 percent. As with other such public companies, its ownership can be changed by a vote of the members, with no prohibition on outside investments.

Monthly meetings are not open to the public except as invited. There is an annual audit Board members appointed by the City Council are: Mr. Zeljko Kalinovic (chair), Ms Ljubica Tucakovic, Ms Jadranka Nikolov, and Mr. Nikola Skaro. Unikom is represented by Mr. Mirko Sabo. The Director is Tomislav Glavas (telephone: 031-122-149).

The company's service area includes the city of Osijek and the village of Cepin. There is interest in expanding the company's service area into the portion of the County that is currently in Sector East.

There is nothing in the collective bargaining agreement to limit the company's operations or jurisdiction. As with other companies, the conditions of work must be negotiated. Wages are as follows: Truck drivers make 2,600 kunas per month, collectors make 2,400 kunas per month, and the bulldozer operator makes 2,600 kunas per month.

Financial

Unikom covers its capital and operating cost from the revenues. The company can request capital investment from the City, but has not had the need for such a contribution for the past four years.

The company reported that it generates a profit on its waste management operations.

Service Charge

Households and businesses are charged a service fee based on the square meter area of building that houses their respective dwelling or work space. The current charges in kunas per square meter per month are:

Household (1 pickup per week)	0.22
Household (2 pickups per week)	0.25
Business	0.30

Twice per week collection is provided in the central city. This section of the city has predominantly older housing with limited storage space for waste.

The current service charge has been in effect since 1993, when it was approved by the City Council. Unikom sought a rate increase in 1996. The petition was rejected because of political concern about a price increase just prior to an election.

Unikom collects the service charge from households on a quarterly basis. Company employees collect money directly from residents on a door-to-door basis. Only about five percent of residents fail to pay for their waste management services.

Business accounts are mailed an invoice each month. Unikom reported more of a problem on collecting on these accounts because of the decline in business activity, as a result of the war. Only about 40 percent of businesses pay their invoice with currency, the other companies barter for the waste management service.

Collection

Organized waste collection reportedly began in 1893, when firemen began providing this service in their spare time.

Quantity. Unikom collects about 35,000 tonnes per year of waste from 42,000 households and 600 businesses in its service area.

Operations. Unikom collects waste five days per week with a fleet of six rear-load packer trucks and seven lugger trucks. The capacity of the packer trucks ranges from 12 to 16 cubic meters, and range in age from 2 to 10 years. However, five of the trucks are relatively new, ranging in age from two to three years.

The lugger trucks are used to transport larger waste containers (e.g., five cubic meters). These trucks range in age from 1 to 10 years, but four of the trucks are between 6 and 10 years old. The useful life of a truck is generally assumed to be seven years. Beyond that age, maintenance costs tend to become expensive for a truck used on a regular basis.

A crew of five employees is assigned to the packer trucks. A crew is composed of a driver and four laborers. Because back-up staff are assigned to waste collection, the total number of employees assigned to waste collection amounts 40 employees. The crew is paid based on a 42 hour work week, but work on a “task and finish” basis, which means a crew may leave once it completes its assigned routes for a day..

Household waste is collected from the curb, and residents are required to place their waste there for collection. Waste may be set out for collection in any type of container, including waste cans, plastic bags, and corrugated boxes. An estimated 20,000 waste cans are in use among the 40,000 residences serviced by Unikom. Unikom also places lugger containers (5 cubic meters) at strategic locations in the central city, so residents can dispose of larger items (e.g., household appliances).

Disposal

The disposal site, which is located just to the west of the city, began operations about 1.5 years ago. The facility replaced a temporary dump that was located near the current site. The temporary dump was used during the war, when Osijek’s disposal site in Nemetin became unavailable.

The Nemetin site, which is in Sector East, remains unavailable. Nemetin could be used again after reintegration. However, it would most likely be expensive bring the site, which borders a river, into compliance with environmental regulations.

The current disposal area covers about 120 meters by 50 meters and is about 10 meters in height. The final height in the current phase will be about 12 meters. An estimated

50,000 tonnes of waste has been deposited, which equates to an in-place density of about 1,100 kilograms per cubic meter of net air space. Soil used to cover waste accounts for 25 percent of the site capacity.

Once the facility reaches the projected maximum height, the landfill will be expanded laterally. This horizontal expansion will cover about 25 hectares.

Quantity. The only waste received at the facility was reportedly the refuse collected by Unikom. Soil from the cleaning of drainage ditches and construction sites is accepted for use as cover material.

Operations. The disposal site is open to receive waste and soils from 6.00 to 22.00, seven days per week. While the site is closed, a city employee provides security. Unikom has one employee at the facility. The employee works from 06:00 to 14:30.

An old track machine (e.g., bull dozer) is used to spread and partially compact the waste. This machine is also used to cover waste with soil. Waste is reportedly compacted and covered about every 10 days.

Trucks were tracking dirt on to a paved road adjacent to the site. A truck tire wash is proposed as a means to minimize dirt being tracked on to the paved road. A used trailer located at the entrance gate is used as a shelter by the security guard.

There is no weigh scale at this facility, but there is a scale at the Nemetin site. The scale could be moved to this disposal site, or the regional landfill, if the unit is in a suitable condition.

Environmental Protection. The disposal operation is a controlled landfill both from the perspective of air emissions and leachate control.

Waste is covered with soil on a regular basis. Cover material minimizes the presence of pests (e.g., birds, rodents, insects). In addition, there was no evidence of waste burning. The site also was constructed with gas chimneys. These chimneys are designed to allow the gases generated during waste decomposition (e.g., methane) to be vented to the atmosphere. Such gas control systems are useful at sites where waste is deposited below grade, as the gas can migrate off site. This can present a hazard, if there are buildings nearby, as there could be a build up of landfill gas within a structure. Landfill gas, such as methane, can accumulate to an explosive level. Since the Osijek facility is entirely above the surrounding land, any lateral migration of gas would be simply discharged to the atmosphere.

Collection pipes have been installed under the waste to collect the leachate discharged from the bottom of the waste mass. Leachate control appears to be aided as the soil seems to have a high content low permeability clay, which would inhibit water flow downward rather than towards the collection pipes. Nonetheless, some leachate may be moving down through the soil. Reportedly, the pipe system is recovering about three cubic meter of leachate per day.

As the site area increases the leachate will be pumped to the top of the landfill and sprayed on the waste mass.

Vinkovci

Waste Company

The company that provides waste collection and disposal services in Vinkovci is Nevkos. Not a public company, but an employee owned company, Nevkos also provides street cleaning and snow removal services under agreement with the City. Prior to being an employee stock company, Nevkos was a department of the municipal government. Its capitalization, however, was done from "scratch" according to Mr. Pilek.

Established in 1991, 31 of the 60 employees of the company are shareholders. Nevkos has a board of directors comprised of representatives from the shareholders. The directors meet privately and regularly, as they are all company employees. The board of directors is comprised of Mr. Knezevic, Mr. Blakovic, and Mr. Pilek. Mr. Pilek is the operating manager of the company.

The company has applied for registration with the competent court, but has not yet received approval.. Nonetheless it operates like a private company under a franchise agreement (no written agreement was produced) with the city. Ownership change, including investment by outsiders, is up to the board of directors, with member concurrence.

Labor agreement conditions are similar to those of the other cities. Wages area little higher in some categories: truck drivers make 2,800 kunas per month, collectors make 2,100 kunas per month, and bulldozer operators make 2,900 kunas per month. Audits are annual, although the accounts are proprietary.

Service is being provided to Vinkovci and three nearby municipalities. There is an interest in expanding Nevkos' service area to include territory that is currently part of Sector East.

Nevkos submitted a proposal for the right to be the sole waste management company in the City. This proposal was accepted by the City, and once the agreement is in-place Nevkos will have a 15-year concession, beginning in 1997, for waste collection. Nevkos is paying the City a concession fee of 10 percent of total revenue received for waste management services. The company has been working since 1991 without a written concession on waste services.

Financial

The capital and operating costs of the company are covered by revenues. In the event of capital purchases, Nevkos borrows money, and repays the loan from revenue. As an

example, Nevkos plans to purchase a new packer truck for collection. A loan will be taken either from a local bank, or perhaps with a bank from Zagreb, depending on the bank interest rate charged.

The need for capital investment due to equipment purchases has been minimal, as the company has received donated items from various international donors. This equipment is used, and in some cases quite old. As an example the last donation was two rear-load packer trucks for waste collection. Both of the trucks are 18 years old.

Nevkos reported that it made a profit on waste collection and disposal. In 1995, as an example, the company had retained earnings of 400,000 kunas. This money was invested in a new truck garage, which cost 420,000 kunas. Reinvestment of earnings rather than paying a dividend allows the company to avoid paying the 35 percent tax on profit.

The company reports that it losing 400,000 kunas per year due to uncollected service charges. Since the company is providing service and, thus, incurring the cost of operation, this uncollected revenue amounts to lost profit.

Service Charge

Households and businesses are charged a service fee based on the square meter of building that houses their respective dwelling or work space. The current charges in kunas per square meter per month are shown below.

Household	0.30
Business	0.36

Although a defined rate was given for businesses, larger waste generators were reportedly able to negotiable a lower charge. The households serviced by Nevkos are billed on a quarterly basis.

The current rate went into effect in 1996. This rate is a 10 percent increase over the previous charge, which was in effect from 1991 to 1996. The price increase, which had to approved by the City, covered the cost of the concession.

Collection

Quantity. Nevkos collects waste from 11,000 households and 930 businesses.

Operations. Nevkos collects waste with a fleet of four rear-load packer trucks and two luggers. The fleet includes nine other trucks, some of which are inoperable. The packer trucks, which have capacities in the range of 16 to 22 cubic meters, range in age from 8 to 18 years, while the luggers are 8 years old. The company has plans to purchase a new packer truck.

The basic collection fleet operates five days per week, and two of the trucks operate six days per week. A crew of three—one driver and two laborers—are assigned to each packer truck. A lugger crew is comprised of two employees—one driver and one laborer. The crews work on a "task and finish" basis, but are paid on an 8 hour per day basis. Household waste is collected once per week.

Disposal

Quantity. The landfill receives the waste collected by Nevkos as well as waste delivered by others. Although records are kept on the volume of such waste received, there are no weigh scales, the volume of non-Nevkos waste received was not readily available. The disposal charge for non-Nevkos waste received at the dump is 10 kunas per cubic meter.

Operations. Nevkos operates a temporary dump site that has been in operation since 1991. The dump, which is open to receive waste from 7.00 to 15.00, has one employee.

An old track machine (i.e., bulldozer) is used to push waste from where it is dumped from collection vehicles.

The dump is located on a narrow strip of land between a channeled stream and wooded land at the extreme southern boundary of the city. Access to the site is from a dirt road that runs about one kilometer from a paved highway. There is no gate or fencing around the dump.

The dump was estimated to be rise to about 12 meters above the base grade and is about 15 meters wide at the top, which has been leveled. The dump site is about 100 meters in length. Access to the working area of the dump is along the length of the site.

Environmental Protection. Air emissions (e.g., particulates) were being emitted from open fires at several locations on the dump. Other air pollutants also were likely to be emitted from the dump.

There was no system to collect and treat leachate, which most likely being discharged into the adjacent stream.

A significant amount of waste had been dumped at the beginning of the dirt access road that led to the disposal site.

Other Areas Within the Two Counties

Organized waste collection services are provided to 57 and 28 percent of the inhabitants in Osijek-Baranja and Vukovar-Srijem Counties, respectively, according to the sections on from a nationwide report on waste management in Croatia.

The report assumes that the portions of the counties in Sector East receive no organized waste collection. This assumption overstates the situation. As an example, there is organized waste collection and disposal in Vukovar. Nonetheless, the lack of waste management services appears to be widespread.

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APPENDIX 2

SOLID WASTE MANAGEMENT SYSTEM

The proposed regional authority plans to develop and operate a landfill for the disposal of solid waste. A project of this nature requires that an administrative structure be established to manage the project throughout its life. Also because waste will be landfilled at a site distant from at least some of the communities where the waste is collected, it will be necessary to transport the waste longer distances than is currently done. Such waste should be transferred into larger vehicles for transport to the landfill.

No respondents in interviews to date have expressed an interest in having a new authority be responsible for collecting solid waste within the communities. The assumption is, rather, that the regional authority will be in the disposal business primarily. Presumably the role of the municipalities will be to arrange to collect the waste (through existing companies or new ones formed to compete for concessions), to haul it to transfer stations where appropriate, and to find ways to keep materials out of the waste stream for economy's sake.

The makeup of the authority board, and the explicit mission of the authority, can easily fit into a best practice framework, in that Croatia's laws do not overly limit the shape of the organization or the scope of its activities. The following is a description of the possible authority structure and its functional makeup, subjects for intense discussion at the June workshop:

AUTHORITY

Management

Board

Membership/Term. The Directors on the governing Board should be appointed by the communities that comprise the Authority. The term of a Director's appointment should be limited to a defined period (say four years) with an option for reappointment.

During the startup phase of the Authority, Director's terms should be staggered to avoid a future situation in which all the Directors are replaced at one time. The staggered terms of the three core cities should be such that the Director appointments be for two, three, and four years (based on an assumed four-year term limit). The assignment of the initial term periods to each city could be done the basis of a lottery for impartiality.

Voting Rights. The voting rights of the Authority members can be structured in two different manners. One approach is proportional, based on population, voting. A second approach is for each member community to have a vote. The latter approach is most workable in situations where the participants are reasonably equal in size.

Advisory Board

Establishment of an advisory board enables the Authority to draw upon the specialized knowledge of various segments of the communities to be served. Composition of the advisory could include representatives from the following groups:

— Government agencies (e.g., county planning department, State Directorate of Environment);
— Waste related companies (e.g., collection companies, recycling companies);
— Civic leaders; and
— Non-governmental organizations (e.g., environmental groups).

The advisory board can be useful tool to the Authority in addressing specific issues that will arise in the development and operation of the landfill project. An advisory board also provides a forum for public input on the activities of the Authority.

Staff

A person will need to manage the daily activities of the Authority. Aside from this person, other professional functions (e.g., legal, accounting) may be filled be outside contractors, at least in the initial period.

Construction and operations of the landfill and related waste activities (e.g., transfer station and transport) could be staffed with Authority employees. An alternative is to contract with a company with experience in providing such services. In general, the contract option is the more cost efficient route.

Functional Areas

Among the functional activities the Authority should address in assessing its scope of services related to landfill development and operation are:

Public Education/Outreach: the public should be kept informed on the activities and direction of the Authority and public comment should be solicited on an ongoing basis.

Procurement: an open, competitive process will result in the Authority receiving the most cost effective pricing for the service being sought

Financing: the capital costs of a landfill can be meet using the borrowing ability of the member communities of the Authority. An alternative is a revenue financing based on the anticipated income to be generated by the landfill to repay the loan. This approach will require that the project components be well defined, as the loan,

generally, would not be backed by the taxing ability of the member communities. Since this finance approach has more risk, a higher interest rate with the loan would be expected.

Marketing: an ability to sell extra disposal capacity will be needed if the site is to marketed to communities in addition to the Authority members. This service could be provided by a private operator if this method of operation is selected by the Authority. The operator might receive a percentage of additional revenues generated by a higher quantity received. The Authority would need to monitor such activity in terms of marketing approach and quantities received to be sure that no illicit activities were being practiced.

DISPOSAL SYSTEM

Landfill

The design and operation of the Authority's landfill will need to be undertaken based on the regulations to be issued most likely within the next three months. In addition, generally accepted practices also should be taken in account in this process.

Design

The landfill design issues in the soon to be issued regulations cover several topics including:

- Distance between ground water and the initial layer of waste;
- Minimum hydraulic conductivity of the base grade soil;
- Drainage system to collection leachate;
- Leachate treatment system;
- Gas collection system;
- Landfill access road;
- Controlled site access; and
- Facility infrastructure (e.g., site office).

The landfill also should have scales (inbound and outbound) so that waste deliveries can be properly invoiced. Groundwater monitoring may be another aspect of the site design in order to track changes in water quality that might result from the disposal activities.

A phasing plan for the sequence in which waste will be deposited in the landfill should be part of the site design. Such a plan is intended to maximize use of the available air space and to minimize the environmental aspects of site operations.

The facility plan also should include specifications for the closure and post-closure design and operations. The proposed regulations include provisions for ongoing care of a landfill after waste disposal operations have ceased.

Operations

A good operation plan is important for reasons of efficiency, economy, and environmental protection. The rules of a well run site are:

— Begin landfilling on high ground and work towards low ground;
— Spread waste loads and compact using a heavy, wheel-type landfill compactor;
— Active area should be as small as possible;
— Minimum of three horizontal to one vertical waste slopes should be maintained;
— Surface water should be diverted away from waste to minimize leachate generation;
— Water in contact with waste should not be diverted away from the landfill; and
— All weather roads should be constructed on the landfill;

The operating plan for a landfill should include provisions for:

— Covering waste;
— Fire control;
— Litter control;
— Dust control;
— Access road maintenance;
— Equipment maintenance; and
— Environmental protection systems (e.g., leachate collection) maintenance.

Transfer

Transfer Station

The two basic types of waste transfer are:

Open-top loading: Waste is placed in container or trailer with open top that is covered with a lid or tarp prior to transport. Two approaches to this type are:

— Non-processed: Waste is dumped directly into a transport container; and
— Processed: Waste density is increased before and/or after loading.

Compaction loading: Waste is mechanically compacted with this type of transfer system. The three approaches to this type are:

— Loading compactor: Waste is compacted into a trailer with a mechanical ram;
— Pre-compaction: Waste compressed within the compactor into 10 to 20 tonne unbound loads; and
— Baling: Waste is compressed into 0.75 to 1.50 tonne bound loads.

Given the size of waste streams likely to be transferred to the landfill, the most economic transfer approach will probably be non-processed, open-top loading. The payload per trip will be less than with the other options, but the cost to achieve a higher transport load would most likely be too high.

A direct dump transfer facility requires that the vehicles delivering the waste be on a level above the top of the vehicle into which the waste will be dumped.

The transfer facility can be as simple as a ramp leading to an elevated platform. Conversely, the receiving container can be driven down a ramp to a level below the dumping platform. The transfer area could be enclosed to prevent waste from becoming wind blown

Transfer Haul

Truck transport is the option best suited for hauling waste from the member communities to a regional landfill. Consideration should be given to rail transport if waste from outside Eastern Slavonia is to received at the landfill. In this latter case, waste transport should be shipped in intermodal containers unless the transfer station(s) and landfill or both directly rail served.

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APPENDIX 3

POLITICAL DYNAMICS HELPING AND HINDERING THE FORMATION OF A SOLID WASTE DISTRICT

Much of the political difficulty has to do with the superior legal role of counties over municipalities in the Croatian government hierarchy. This has been confirmed by comments made at interview sessions and in private conversations with county and municipal officials. Of equal importance is the party rivalry that is being exacerbated by the upcoming election. What is not so obvious are the subtextual issues having to do with the methods the municipalities are using to further the cause of regional cooperation. County officials feel generally that the municipalities will not fail to use the regional approach to challenge the counties' superior legal position.

One cannot expect local politicians to open up completely to consultants from afar, and state the real reasons for opposing or supporting municipal efforts. Both direct and indirect questioning techniques were used, and although some lines of questioning met with polite evasion, enough was gleaned from interviews and private conversations with key people to offer the following comments on the political dynamics in this situation:

> The reality of site selection is that the major, and the first, disposal site must be in an HDZ city. Osijek Deputy Mayor Herman confirmed that on March 14, when he also spoke of the need for the cities to move quickly on executing an MOU.
>
> That MOU preparation has been expedited by Mr. Domanovac of the Osijek municipal government, who has prepared a draft with Attorney Vedris. He spoke to her about the process being so far along that a site has been tentatively chosen, in a location near Vinkovci, which is an HDZ-controlled municipality.
>
> Herman confided that he has held lengthy negotiation sessions with Mr. Eres of Vinkovci, and everything seems to have come together over the past few weeks.
>
> Herman's view is that the counties have absolute power over site selection, and hence the success or failure forming a district. He apparently has conceded on the site question in order to move the project along. He believes that the three cities represent a potent lobby in the Parliament, to which he aspires as a decentralization proponent. He wants to execute an MOU with Djakovo and Vinkovci, and then and only then involve the counties.
>
> The MOU, as drafted as of March 14, provides for a year of preparation and transition into a formal, ongoing regional organization. Executing the MOU, which reportedly has been agreed to with minor changes by the three cities, will be the starting point for open discussions with all the major players. Herman agrees that the counties are not to be denied a role, and advisory seats on the authority board, or some arrangement of that level, is necessary and desirable.

An early reaction to the MOU by Djakovo officials was that the MOU as drafted seemed to put a lot of the power in the hands of Osijek, with the first year's funding to be put in a special account in the Osijek municipality budget. Domanovac of Osijek said this was to be done for legal reasons, in that there must be repository fro funds which is a municipal entity. Attorney Vedris, however, stated that the arrangement is for convenience only, and the repository need not be a municipality. This may be a minor sticking point during initial negotiations among the cities, in that it gives the appearance of an imbalance in power, where in reality it need not happen as drafted, and in any event the money would legally be safe from control by the Osijek government.

The statutes of Croatia give counties specific powers as the prime units of local self-government, with municipalities established as sub-units. The counties are uneasy about assertions of power by the municipalities individually, and they become more uneasy as they contemplate this new authority, which is not only unprecedented in practice, but unclear as to how its activities as a "trash magnet" will influence the counties' future solid waste strategies. That is, the authority will take on informal powers in proportion to its ability to negotiate with potential new customers, and even delve into long distance hauling by truck, barge, and rail.

The counties legitimately will have much to be concerned about the authority if it develops a supply-side mentality and puts on pressure to increase its scope of activities over the years, even to the extent of changing its charter to go into the collection business.

What will make that truly unpalatable for the counties is the specter of a two-county organization, comprised of all the municipalities and a significant number of collection entities, all pushing for liberalization of county controls, ultimately to a level consistent with modern democracy.

That two-county organization will be comprised of municipal representatives from the party in power and any number of other parties over the years, all working toward the goal of maximizing planning and operational autonomy.

The unease the two counties will feel, and already feel, will be mobilized into regulatory roadblocks to stop the regional project unless the municipalities and outside facilitators find ways to accommodate the counties in terms of participation, as discussed in the findings and recommendations section. Accommodation and timing will influence the outcome of the authority's establishment as a countervailing force to the central government in a general sense. The battle over decentralization will not be openly fought in these two counties, but rather in Parliament. The contribution this regional effort will make will lie in the level of attention and support it will receive from other groups of municipalities and from reformers with influence in Zagreb.

One of the expressed sticking points in intergovernmental cooperation is the fact that the municipalities went ahead with discussions without informing the counties or inviting their participation. This was a calculated move on the part of the municipalities, and should have no effect on county attitudes, in that it was no surprise, and is happening partly in response to the Osijek-Baranja County's intransigence about approving the reopeningof the Nemetin landfill.

A sticking point that may cause problems is the municipalities' having held substantive discussions with a French firm concerning its investment and/or management role in the authority. The exact status of an alleged MOU with the company is not known as of March 14, but whatever involvement there has bee with a foreign firm will provide ammunition for the county to level a political broadside.

A more subtle sticking point is the ability or inability of Srijem County to contribute technical and administrative leadership in the planning phases for the authority. Due to the war, Srijem County has critical needs which take precedence over the solid waste problem. This is reflected in the lack of a solid waste plan, with none required until 1999. Also, the consultants perceived a lack of technical knowledge among some of the key respondents in Srijem County. For these reasons, and others as discussed in the findings and recommendations section, it may be advisable to leave Srijem county out of an all-inclusive, two-county "official" landfill, and simply take Srijem County municipalities in as customers. Leaving one county out while accommodating the needs of its cities has appeal, especially in terms of municipal leadership and strategic thinking.

In open meetings county officials report no possibility of funding for the capital costs of a regional disposal facility. However, there is some indication that once the plan is laid out to the satisfaction of the two counties there may be significant, but not high levels, of funding for jointly run operations, such as a hazardous waste facility as part of a larger site, in that the counties are by law obligated to deal with hazardous wastes.

There is no evidence thus far that the county governments have designs on collection companies, although there is a fraternal affiliation in Osijek. There is always a danger that sweetheart deals can be made in the municipalities in the concession arrangements with companies. A greater danger is in the forgiveness of fees due to war damage and the economic distress of some enterprises. Barter payment arrangements now in effect hint at widespread abuse in the future if proper municipal oversight of collection companies is absent.

There is no indication that the various *obcina*, or municipaliites, outside the boundaries of the three cities, are a power base of their own or pawns of the counties.